

## STATISTICS WORKSHEET - 3

Q1 to Q9 has only one correct answer. Choose the correct option to answer your question.

**1. Which of the following is the correct formula for total variation?**

- a) Total Variation = Residual Variation – Regression Variation
- b) Total Variation = Residual Variation + Regression Variation**
- c) Total Variation = Residual Variation \* Regression Variation
- d) All of the mentioned

**2. Collection of exchangeable binary outcomes for the same covariate data are called outcomes.**

- a) random
- b) direct
- c) binomial**
- d) none of the mentioned

**3. How many outcomes are possible with the Bernoulli trial?**

- a) 2**
- b) 3
- c) 4
- d) None of the mentioned

**4. If  $H_0$  is true and we reject it is called**

- a) Type-I error**
- b) Type-II error
- c) Standard error
- d) Sampling error

**5. Level of significance is also called:**

- a) Power of the test
- b) Size of the test**
- c) Level of confidence
- d) Confidence coefficient

**6. The chance of rejecting a true hypothesis decreases when the sample size is:**

- a) Decrease
- b) Increase**
- c) Both of them
- d) None

**7. Which of the following testing is concerned with making decisions using data?**

- a) Probability
- b) Hypothesis**
- c) Causal
- d) None of the mentioned

**8. What is the purpose of multiple testing in statistical inference?**

- a) Minimize errors
- b) Minimize false positives
- c) Minimize false negatives
- d) All of the mentioned**

**9. Normalized data are centered at and have units equal to standard deviations of the original data**

- a) 0**
- b) 5
- c) 1
- d) 10

**Q10 and Q15 are subjective answer type questions, Answer them in your own words briefly.**

**10. What Is Bayes' Theorem?**

Ans. In probability, the Bayes theorem is a mathematical formula, which is used to determine the conditional probability of a given event. Conditional probability is defined as the likelihood that an event will occur, based on the occurrence of a previous outcome.

$P(A|B)$  is the probability of event A occurring given that B is true.  $P(B|A)$  is the probability of event B occurring given that A is true.  $P(A)$  and  $P(B)$  are the probabilities of observing A and B respectively without any given conditions.

**11. What is the z-score?**

Ans. In statistics, Z-score is the method to find out the outliers present in the data, and also z-score shows how much the particular point is away from the standard deviation. Z-scores range from -3 standard deviations up to +3 standard deviations.

Formula for find out the z-score is :  $z = (x - \mu) / \sigma$  where ,  $x$  = data point  $\mu$  = Mean value  $\sigma$  = Standard deviation

**12. What is a t-test?**

Ans. The independent sample t-test or 2 samples t-test compares the mean of two independent groups in order to determine whether the mean of two different variables is identical or not.

**13. What is a percentile?**

Ans. In statistics, the percentile is used to indicate the value below which the group the percentage of data fall. For example, the 20th percentile is the value (or score) below which 20% of the observations may be found.

#### **14. What is ANOVA?**

Ans. ANOVA test is a type of statical test that allows a comparison of more than two groups at the same time it helps to determine whether a relationship exists between them or not.

#### **15. How can ANOVA help?**

Ans. The one-way ANOVA can help you to determine whether or not there are significant differences between the means of your independent variables (for ex- Age, Sex, Position). When you understand how each independent variables are different from others, you can begin to understand which of them has a connection to your dependent variables and begin to learn what is driving that behavior.